

Erbijev vlakenski ojačevalnik

$$W = P_s \cdot t = N h f = N \cdot \frac{h c}{\lambda}$$

N... št. erbijevih ionov

$$2d = 10 \log \left( \frac{N_2}{N_1} \cdot |\Gamma|^2 \right)$$

Laserški ojačevalnik

$$P' = P \cdot a \frac{\lambda}{\lambda_0} \left( \frac{\lambda}{\lambda_0} \right)$$

n<sub>1</sub> v dB

λ... vhodni signal

λ... val. dol. ojačevalnika

APD - FET sprejemnik

$$Q = |Q_e| N \eta \cdot M$$

$$U = |Q_e| \cdot N \cdot \eta \cdot M \cdot C \cdot R_t = \frac{P \cdot \lambda \cdot \eta \cdot |Q_e| \cdot M \cdot R_t}{h c}$$

M... faktor množenja

N... št. fotonov

Laser ojačanje (G)

$$\frac{dG}{dz} = \frac{1}{2L_r} (-20 \log(\Gamma_1 \Gamma_2))$$

$$S = \frac{|E|^2}{2Z_0}$$

$$P = S \cdot A = S \cdot w \cdot h$$

širina odprtine

$$NA_1 < NA_2$$

$$d_1 < d_2$$

n<sub>1</sub> > n<sub>2</sub>

Daljinec → TV

$$P_s = P_o \frac{A}{4\pi r^2} \leftarrow \text{neumirjen} \quad \text{oz. } P_s = P_o \frac{A}{50 d^2} \leftarrow \text{Kumirjen 2011}$$

$$U_s = \frac{Q}{C_d} = \frac{\eta |Q_e| P_s}{C_d h f C} = \frac{\eta |Q_e| \lambda P_s}{C_d h c C}$$

C<sub>d</sub>... kapacitivnost

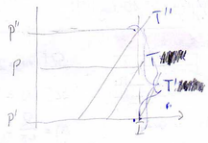
U<sub>s</sub>... napetost na fotodiodi

Fotopomnoževalka

$$I_k = \eta \cdot N / |Q_e|$$

$$M = \frac{I_A}{I_k} \dots \text{faktor množenja}$$

Temp. odvisnost



$$\frac{P}{P''} = \frac{T' - T}{T' - T''}$$

$$P = \alpha \cdot \beta \cdot T \quad \alpha = kI - kb$$

$$P' = \alpha \cdot \beta \cdot T' \quad \beta = -ka$$

$$P'' = \alpha \cdot \beta \cdot T''$$

$$Q_e = 16 \cdot 10^{19} \text{ As}$$

$$h = 6.624 \cdot 10^{-34} \text{ Js}$$

$$c = 3 \cdot 10^8 \frac{\text{m}}{\text{s}}$$